

Outcome of Hypospadias Repair: 4 Years Experience in King Abdulaziz University Hospital: A Retrospective Study

Osama M. Rayes, FRCSI

*Department of Surgery, Faculty of Medicine,
King Abdulaziz University, Jeddah, Saudi Arabia
orayes@kau.edu.sa*

Abstract. Hypospadias is one of the most frequently seen urogenital disorder all over the world. The study of all records of seventy patients operated for hypospadias repair in King Abdulaziz University Hospital (KAUH), Jeddah, Saudi Arabia were reviewed by the author and/or his team from June 2005 to May 2009. More than half of them were operated upon the age of 2 years (57%) and under. The native meatus was distal penile, mid-penile and proximal penile in 53, 9 and 8 patients, respectively. Nearly half of the patients were repaired using the TIP "Snodgrass" technique and meatal-based flap "Mathieu" technique was the next common used. In this work, a four years' experience in treating hypospadias cases ranging from glanular to scrotal level of severity using several techniques was evaluated. Results and conclusions are presented.

Keywords: Hypospadias, TIP repair, Fistula, Mathieu repair.

Introduction

Hypospadias is a congenital abnormality involving the location of the urethral meatus. Most estimates of prevalence of hypospadias in Europe and the USA range to a maximum of 3 per 1,000 births, with two-thirds to three quarters of the cases being glanular or coronal^[1].

Correspondence & reprint request to:

Dr. Osama N. Rayes
P.O. Box 80215, Jeddah 21589, Saudi Arabia

Accepted for publication: 05 March 2013. Received: 06 February 2013.

Several factors interact to determine the type of repair, such as meatal site, presence of chordee, availability of the prepuce, and quality of the urethral plate, in addition to the surgeon's experience^[2].

In this work, our experience for four years in treating hypospadias cases ranging from glanular to scrotal using several techniques is evaluated.

Materials and Methods

All the records of the seventy patients operated upon for hypospadias repair in King Abdulaziz University Hospital (KAUH), Jeddah, Saudi Arabia by the author and/or his team from June 2005 to May 2009 were retrospectively studied. As regards to the personal data, the following information was gathered; nationality, date of birth and age at operative management. Moreover, type of hypospadias, presence or absence of chordee, status of the foreskin and gonads were evaluated. Operative techniques done included; Meatal Advancement Glanuloplasty Incorporated (MAGPI), Urethral Advancement Glanuloplasty Incorporated (URAGPI), dorsal meatotomy, the meatal-based flap "Mathieu", tubularized incised plate (TIP) urethroplasty "Snodgrass" and transverse preputial island flap "Ducketts".

Most of the patients were examined one day before surgery and routine laboratory investigations were done. Post-operatively, most of the patients with distal hypospadias were discharged with the urethral stent in place to be followed up in the clinic. In proximal level cases; however, almost invariably all the patients were hospitalized until removal of the urethral stents. Antibiotics were prescribed as long as there was urethral stent.

Outcome was evaluated by reviewing notes of post-operative clinic visits of most of the patients and in few cases, due to deficient information, patients had to be summoned to be reexamined and reassessed. No post-operative routine investigation test was ordered. The main concern in our outcome assessment was occurrence of complications, direction of urine stream and cosmetic satisfaction of the parents.

Surgical Techniques used

Meatal Advancement Glanuloplasty Incorporated (MAGPI) was described by Duckett in 1981^[3]. The technique was as Duckett described except from when circumcision was performed as well. The procedure started with a circumferential sub coronal incision proximal to the meatus followed by longitudinal incision of bridge of tissue between meatus and glanular groove with transverse closure. Glans edges were closed in two layers to reconfigure a conical glans, then sleeve approximation for skin coverage after circumcision.

Urethral advancement glanuloplasty incorporated, however, was first described by Keramidias and Soutis in 1995^[4], and was based on the amenability of the urethra to mobilization and advancement to the tip of the glans^[5].

Mathieu, Snodgrass and Duckett's island flap were done as described by their founders^[6-8]. In most of cases, circumcision was done at the same session of the repair itself.

Postoperative Care

All patients began oral intake after full recovery with a hospital stay ranging from one day in distal hypospadias to 10 day in severe cases. Prophylactic antibiotic (amoxicillin/clavulonic acid) was administered as long as there was a urethral stent. In MAGPI and URAGPI cases urethral catheters were removed either immediately postoperative or within 48 hours. However, in "Mathieu" and "Snodgrass" cases, catheters were removed on the 7th postoperative day. Duckett's flap repair cases urethral stent was removed on the 8th to 11th day postoperative; in addition they had supra-pubic catheter inserted which was removed 1-2 days after the urethral stent.

The dressing used postoperatively consisted of a layer of Vaseline gauze on the wound, followed by ribbon gauze and a mildly tight elastic adhesive tape. In most of the cases, feeding tube size 8-10 Fr was the urethral stent used, while in few cases Foley's catheter size 8-10 Fr was used as the stent.

Pain control in the early postoperative period depended mainly on the caudal block administered by the anesthesiologist preoperatively. Furthermore, paracetamol (20 mg/kg PO/PR q 6 hr) and diclofenac Na

suppositories (0.5-1 mg/kg PR q 12 hr) both are given regularly to keep the patient pain free during the 1st 48 hrs; and occasionally pethidine (1 mg/kg IM/IV q 8 hr) were used according to the patient's pain condition in the first 24-48 hrs.

Mothers are instructed to be sure of daily soft bowel motions of the patient to avoid straining and given glycerin suppository, and/or lactulose orally if needed.

Follow up program entitled weekly clinic visit for the first post-operative month, followed by monthly visits for three months then after 6 months, and discharge if results were satisfactory to both surgeon and parents. With occurrence of any complication or unsatisfactory result, follow-up would continue until further management is decided. No routine calibration of the meatus was done in any of the postoperative visits, unless there was a complaint of narrow stream and/or dysuria.

Results

Total number of hypospadias patients underwent repair by the author or his team members during the period from June 2005 to May 2009 was 70 cases. More than half of them were operated upon under age of 2 years (57%) (Table 1). The documented follow-up period ranged from 1 week postoperative to five years. The native meatus was distal penile, mid-penile and proximal penile in 53, 9 and 8 patients, respectively (Table 2). Six patients were circumcised before they came to us. Chordee was seen in 12 patients only. Undescended testis was an association in 9 patients (Table 2). Nearly half of the patients were repaired using the TIP "Snodgrass" technique (33 patients [47%]). Meatal-based flap "Mathieu" technique was the next common used in 13 patients (18.5%). The following was performed; MAGPI repair in 8 patients, Transverse preputial island flap "Duckett" in 7, Closure of urethral fistula in 4 cases and URAGPI done in 3 patients only as in Table 3. Theirsch-Duplay technique was used in only two patients.

Table 1. Age at operation.

Age at OR	≤ 2 years	2-5 years	> 5 years
No. of Patients	40 (57.2%)	24 (34.2 %)	6 (8.6%)

Table 2. Distribution of types of hypospadias.

Type	Distal	Mid-penile	Proximal	TOTAL
Total No.	53 (75.7%)	9 (12.8%)	8 (11.5%)	70
No. of Circumcised	5	1	—	6
No. of Patients				
with Chordee	3	4	5	12
with UDT	6	2	1	9

Table 3. Type of procedure.

Procedure	MAGPI	URAGPI	M	S	D	FC	Others
No.	8	3	13	33	7	4	2

M: Matheiu; S: Snodgrass; D: Duckett; FC: Fistula closure

The overall complication is shown in Table 4. Urethral fistula was seen in 9 patients (12.8%), 2 of these with meatal stenosis. Wound disruption was encountered in four patients (5.7%) all showed mild ventral penile curvature after healing.

Table 4. Complications.

EARLY			LATE		Total No. of Patients
Fistula	Disruption	Infection	Meatal Stenosis	Penile Curvature	
9/70 (12.8%)	4/70 (5.7%)	Non	3 [*] /70 (4.2%)	4 [†] /70 (7.1%)	16/70 (22.8%)

^{*}2 of them have fistula as well

[†]All seen after wound disruptions

Eight patients had their fistula closed once and healed. One patient had their fistula at corona that required more than one session of closure.

As shown in Table 5, for TIP cases the overall complication rate was 18.1% (6/33 patients). Fistula and meatal stenosis were encountered in 3 and 2 patients, respectively (9% and 6%) among the 33 cases. While in Duckett's cases, the overall complication rate was 57% (4/7 patients), fistula occurred in 3 patients. Mathieu procedure had an overall complication rate of 38.4% (5/13 patients) and MAGPI had no complications in our series.

Table 5. Complication rates according to various techniques.

	TIP	Mathieu	Duckett
Total No. of Patients	33	13	7
Overall Complication Rate	6 (18.1%)	5 (38.4%)	4 (57%)
Complications			
Fistula	3	3	3
Disruption	1	1	1
Meatal Stenosis	2 [*]	--	--
Penile curvature	1	3 [†]	1 [‡]

^{*}One of them with fistula

[†]Two of them with fistula

[‡]With fistula

Discussion

Hypospadias surgery is challenging worldwide but advancement in technology, better understanding of the pathology, modifications of surgical options and correctly timed surgical repair have led to good results^[9]. The complication rate for hypospadias in adults is higher than in children^[10]. Moreover, the multiplicity of the techniques for repair of hypospadias clearly signifies that there is no ideal procedure^[11].

In this study, the author retrospectively studied all the cases of hypospadias repaired by the author in KAUH. It was noted that earlier in the period of the study, Mathieu repair was commonly used while in the second half of the period of the study, Snodgrass technique held the upper hand with 33 cases compared to 13. Our overall complication rate was 22.8% (16/70 patients) with a rate 12.8% (9/70) for the urethrocutaneous fistula being the most frequent complication. As our study is a compilation of all of the hypospadias repair work that was done during that period of time, it was quite difficult to compare the literature rates with our overall rates as there was several techniques used for different types of hypospadias.

Most of our patients (57.2%) were operated upon below 2 years of age. Schultz *et al.* pointed out that an ideal age might be 6 to 18 months to minimize the emotional effect of this traumatic experience^[12]. In our series, all the patients who were operated upon after two years, it was because of a late referral. However, all cases which were referred to us in the first three months of life were operated upon before completing their second year of life.

Urethrocutaneous fistulae are the most common late complication of hypospadias repair, and their incidence has been used to evaluate the effectiveness of the surgical procedure^[13]. The expected fistula rate is between 10% and 15% for most one-stage hypospadias surgery^[14]. Reviewing the literature about the rate of occurrence urethrocutaneous fistula and meatal stenosis after TIP procedure revealed a rate between 5-9% and 0-5%, respectively in previous studies^[15-19]. In our study, however, the fistula rate in TIP cases was 9% (3/33) while the rate of occurrence of meatal stenosis was 6% (2/33).

In MAGPI and URAGPI repair, however, there were no complications in our 8 and 3 cases, respectively. Needless to say, both

procedures' great results depend greatly on good choice of cases; a glanular, coronal, or distal location of the meatus with a mobile distal urethra is ideal for a MAGPI operation. Lifting the skin below the meatus and pulling it up along with the urethra helps one to judge whether there is enough urethral mobility for the meatus to be positioned at the tip of the glans^[20].

On the other side, Buyukunal *et al.* collected a group of Mathieu series involving 1,060 cases and found that the incidence of complication varied between 1.5% and 11.2%^[21]. In our series, 23% fistula rate was performed in this procedure. This was the reason that pushed the author to change his practice during the latter half of the study to TIP procedure instead of Mathieu technique.

In conclusion, our study revealed comparable results to overall literature figures, especially for MAGPI and TIP procedures. However, our results in Mathieu repair had higher incidence of fistula when compared to the overall complication rate of fistula seen.

Further study should be done by the author to decrease complication rate of such a common disease with a structured policy for procedure choice and treatment steps.

References

- [1] **Dolk H.** Epidemiology of hypospadias. In: *Hypospadias Surgery*. Hadidi AT, Azmy AF, ed. 1st edn. Springer; 2004. 51-57.
- [2] **Erol D, Germiyanoglu C.** [The factors affecting successful repair of hypospadias.] *Urol Bull* 1995; **6**: 138.
- [3] **Duckett JW.** MAGPI (meatoplasty and glanuloplasty): a procedure for subcoronal hypospadias. *Urol Clin North Am* 1981; **8**(3): 513-519.
- [4] **Keramidas DC, Soutis ME.** Urethral advancement, glanduloplasty and preputioplasty in distal hypospadias. *Eur J Pediatr Surg* 1995; **5**(6): 348-351.
- [5] **Koff SA.** Mobilization of the urethra in the surgical treatment of hypospadias. *J Urol* 1981; **125**(3): 394-397.
- [6] **Rabinowitz R, Hulbert WC.** Meatal-based flap Mathieu procedure. In: *Reconstructive and Plastic Surgery of the External Genitalia. Adult and Pediatric*. Ehrlich RM, Alter GJ (eds) Philadelphia, PA: Saunders, 1999. 39-43.
- [7] **Snodgrass W.** Tubularized incised plate urethroplasty for distal hypospadias. *J Urol* 1994; **151**(2): 464.
- [8] **Duckett JW.** Transverse preputial island flap technique for repair of severe hypospadias. *Urol Clin North Am* 1980; **7**(2): 423-430.
- [9] **Osifo OD, Mene AO.** Hypospadias repair in a resource-poor region: coping with the challenges in 5 years. *J Pediatr Urol* 2010; **6**(1): 60-65.

- [10] **Senkul T, Karademir K, İşeri Cn, Erden Do, Baykal K, Adayener Cn.** Hypospadias in adults. *Urology* 2002; **60**(6): 1059-1062.
- [11] **Caione P, Capozza N, De Gennaro M, Cretì G, Zaccara A, Lais A.** Hypospadias repair by urethral sliding advancement and Y-V glanduloplasty. *J Urol* 1991; **146**(2): 644-646.
- [12] **Schultz JR, Klykylo WM, Wacksman J.** Timing of elective hypospadias repair in children. *Pediatrics* 1983; **71**(3): 342-351.
- [13] **Retik AB, Keating M, Mandell J.** Complications of hypospadias repair. *Urol Clin North Am* 1988; **15**(2): 223-236.
- [14] **Baskin LS.** Hypospadias. In: *Pediatric Surgery*. Grosfeld JL, O'Neil JA, Funkalsrud EW, Coran AG, ed. 6th edn. Philadelphia: Mosby Year Book Inc., 2006. 1870-1898.
- [15] **Borer JG, Bauer SB, Peters CA, Diamond DA, Atala A, Cilento BG Jr, Retik AB.** Tubularized incised plate urethroplasty: expanded use in primary and repeated surgery for hypospadias. *J Urol* 2001; **165**(2): 581-585.
- [16] **Elbakry A.** Further experience with tabularized-incised urethral plate technique for hypospadias repair. *BJU Int* 2002; **89**(3): 291-294.
- [17] **Snodgrass W, Koyle M, Manzoni G, Hurwitz R, Caldamone A, Ehrlich R.** Tubularized incised plate hypospadias repair: results of a multicenter experience. *J Urol* 1996; **156**(2 Pt 2): 839-841.
- [18] **Leclair MD, Camby C, Battisti S, Renaud G, Plattner V, Heloury Y.** Unstented tabularized incised plate urethroplasty combined with foreskin reconstruction for distal hypospadias. *Eur Urol* 2004; **46**(4): 526-530.
- [19] **El-Sherbiny MT, Hafez AT, Dawaba MS, Shorrab AA, Bazeed MA.** Comprehensive analysis of tabularized incised-plate urethroplasty in primary and re-operative hypospadias. *BJU Int* 2004; **93**(7): 1057-1061.
- [20] **Lakshmanan Y, Gearhart JP.** MAGPI procedure. In: *Hypospadias Surgery*. Hadidi AT, Azmy AF, ed. 1st edn. Springer; 2004. 51-57.
- [21] **Büyükünal SN, Sari N.** Serafeddin Sabuncuoğlu, the author of the earliest pediatric surgical atlas: *Cerrahiye-i İlhaniye*. *J Pediatr Surg* 1991; **26**(10): 1148-1151.

نتائج جراحة الفتحة البولية التحتية: خبرة ٤ سنوات في مستشفى

جامعة الملك عبد العزيز: دراسة استيعادية

أسامة بن محمد ريس

قسم الجراحة، كلية الطب، جامعة الملك عبدالعزيز

جدة - المملكة العربية السعودية

المستخلص. الفتحة البولية التحتية هي من أكثر التشوهات الخلقية للجهاز البولي التناسلي شيوعاً في الأطفال الذكور على مستوى جميع دول العالم. درسنا ملفات السبعين حالة التي عولجت في مستشفى جامعة الملك عبدالعزيز بجدة بالمملكة العربية السعودية للأطفال تحت عمر ١٤ سنة والذين كان تشخيصهم الفتحة البولية التحتية للفترة ما بين يونيه ٢٠٠٥م ومايو ٢٠٠٩م والذين عولجوا من قبل فريق طبي واحد فقط.. كان أكثر من نصف المرضى (٥٧%) أعمارهم أقل من سنتين. وكانت الفتحة الأصلية قبل إجراء أي تدخل جراحي في الثلث الطرفي والثلث الأوسط والثلث القريب من العضو الذكري بالنسب التالية ٥٣ - ٩ - ٨ على الترتيب. حوالت نصف الحالات عولجت بطريقة TIP والمصوفة من قبل سونوقراس، يتبعها في الاستعمال طريقة ماثيو. في هذه الورقة تم تقويم خبرتنا للسنوات الأربعة المذكورة للفتحة البولية التحتية باستخدام عدة طرق جراحية معروفة. وتم ذكر النتائج والاستنتاجات في نهاية الورقة.